Other Service and Repair

All other service and repairs should only be done by a qualified repair person or shop. Your dealer can help you select one or you can send your Foredom equipment to the Bethel, CT factory. Factory repairs are done promptly and at reasonable cost. Send the equipment marked "Attention: Service Department". Be sure to include your street address, email address, and phone number. The equipment should be accompanied by a brief note describing the problem with the equipment. Estimates will be made upon request.

Storage

Store your Foredom power tools in a dry, clean, dust-free area and out of the reach of children.

Please retain your proof of purchase for warranty repairs.

Contact Information

For more information on Foredom machines, handpieces or accessories, contact your local dealer. When no local dealer is available, write, call, fax or visit on-line:

The Foredom Electric Company
16 Stony Hill Road, Bethel, CT 06801
Tel.: (203) 792-8622 Fax: (203) 796-7861
Email: customerservice@blackstoneind.com
www.foredom.net

LIMITED WARRANTY

Foredom warrants the **M.PGX Motor** (excluding flexible shaft and sheath) and the **C.EMGX Dial Speed Control** to be free of defects in material or workmanship for a period of **2 years** after purchase, the **C.FCGX Foot Switch** for **1 year** after purchase, and the **H.9D Handpiece** for **90 days** after purchase. During the warranty period the defective product will be repaired or replaced without charge or at our option, the purchase price will be refunded. This warranty does not cover damage caused in transit or by accident, misuse, or ordinary wear.
ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF FITNESS AND MERCHANTABILITY, ARE HEREBY LIMITED IN DURATION TO THE PERIOD MENTIONED ABOVE FROM DATE OF PURCHASE, AND WE WILL NOT BE LIABLE OR RESPONSIBLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES.
Repair or replacement will be made at our option if the product is returned post-paid to:

The Foredom Electric Company
16 Stony Hill Road
Bethel, CT 06801

All warranty repairs must be done at the factory at the above address. We will not pay any shipping or transportation charges. *The HP76 Duplex Spring is not covered by this warranty since it is especially sensitive to the pressure and stress variables of each individual operator.* This warranty only covers the original purchaser of the product. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FOREDOM®
The Foredom Electric Company • Bethel, CT USA 06801 • www.foredom.net
Form 1297 n 6/11 Printed in U.S.A.

Owner's Manual

Assembly, Operation and Service for the

PowerGraver® Kit

2-Year Warranty

For Your Own Safety

- **Please read this Assembly, Operation, and Service Manual before operating your Foredom power tool.**
- **Always wear eye protection while using power tools.**

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How-To Videos FOREDOM BASICS

Foredom's National Sales Manager, walks you through the "Basics" of using and maintaining flexible shaft machines. Downloadable mini series of .wmv files each under 5 minutes.

Click to View:

1. **Introduction and Proper Set-up**
2. **Safety Guidelines**
3. **Handpieces and Accessories**
4. **Maintenance of Shafts and Sheaths – Grease and Replace**
5. **Motor Maintenance– Remove Dust, Replace Motor Brushes**

Specifications

M.PGX Motor: 125 Volt DC; Ball Bearing Permanent Magnet Motor, Operable Speed Range: 500–2,800 RPM.

PGX-1 is for use with 115Volt AC.
PGX-2 is for use with 230Volt AC.

C.EMGX Dial Control: Variable speed manually operated electronic control.

EMGX-1 is for use with 115Volt AC.
EMGX-2 is for use with 230Volt AC.

Shaft/Sheath: Shaft S-93 is 39″ long, and .150″ in diameter. Flexible Neoprene Sheath S-76N is 36¼″ long.

Optional FCGX Foot Switch: On/Off foot-operated switching. (115V or 230V AC Current)

Safety Instructions

Before using your Foredom® power tool, please read all these safety instructions. They are for your protection and should always be followed to reduce the risk of personal injury or damage to the tool.

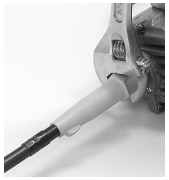
- ***Always wear proper eye and face protection.*** Safety glasses or face shields should be worn whenever you operate a Foredom or any power tool to prevent serious eye or face injuries.

Always make sure your power tool is unplugged during maintenance!

Replacing Worn Shafts and Sheaths

Shafts and sheaths last longer when they are not used at sharp angles or loops, since wear occurs at the points of greatest friction. There is no way to avoid ultimate wear, and under normal conditions a flexible shaft machine may require several replacement shafts and sheaths during its lifetime.

To expose the inner shaft follow steps 1, 2, and 3 on the previous page.

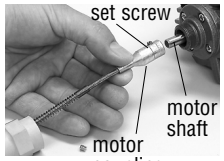


Next, remove motor connector with 1″ open end or adjustable wrench. **Motor connector has a left hand thread and must be turned clockwise (right) for removal.**

Loosen set screw on the flexible shaft motor coupling and slide shaft off the motor shaft.

Installation of New Shaft

1. After removing old shaft, loosen set screw on the new flexible shaft motor coupling and slide coupling onto motor shaft.

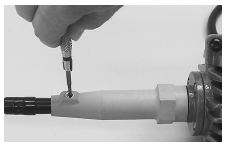


2. Tighten set screw securely onto the flat of the motor shaft.

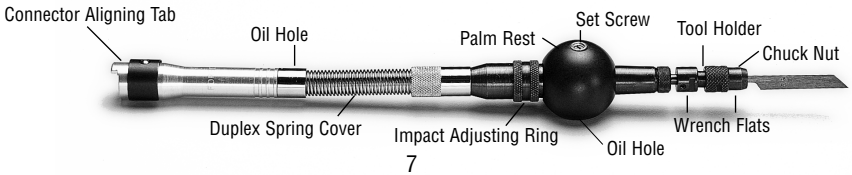
3. Grease shaft prior to putting on the sheath. (See lubrication instructions on page 6.)

4. Slide motor connector back up over the shaft and tighten to the left (counterclockwise).

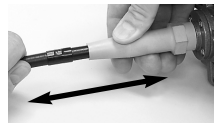
5. Slide sheath over flexible shaft with plain fitting directed toward the motor and into the motor connector. (Each end of the sheath has a metal fitting. One is plain, the other fits the handpiece.)



6. Adjust the shaft as shown at top right side of page and tighten sheath set screw in motor connector.

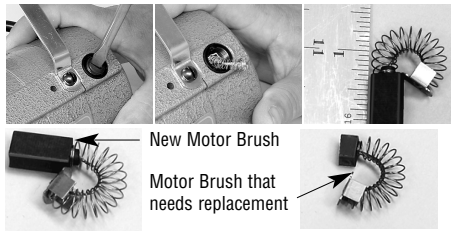


Shaft and Sheath Adjustment:



Place the entire unit on a flat surface with shaft and sheath extended straight. **Adjust the exposed tip of the flexible shaft at the handpiece end so that it extends 3/4″ (19mm) beyond the sheath**, as shown at bottom of page 6. This is done by moving the sheath in or out of the motor connector. When he correct adjustment is made, tighten the screw in the motor connector.

Replacement of Motor Brushes



The motor brushes (MP319P) should be checked for wear periodically. When new, they are approximately 3/4″ long. They should be replaced when they have worn to 1/4″. To remove brushes, disconnect motor power cord and unscrew the brush caps. Be sure that the contour of the brushes match the contour of the armature when replacing them. Be sure to replace both motor brushes even if one of them is less worn than the other.To remove dirt and dust buildup, when motor brushes are checked or replaced, compressed air should be blown through the motor.

Handpiece Lubrication

The H.9D Handpiece requires lubrication approximately every 40 hours of use. Use oiler provided to apply **two drops** of oil into the oiling hole located on the barrel of the handpiece under the palm rest and into the hole on the rear of the duplex spring connection. To remove palm rest, loosen set screw. **Do not apply more than two drops of oil.**

Replacement Fuse

The C.EMGX Dial Speed Control may require CP10543 Replacement Fuse for either 115V AC or 230V AC.

Maintenance Procedures

Always make sure your power tool is unplugged during maintenance!

It is very important to routinely clean your Foredom® Power Tool and lubricate the shaft (NOT the motor), especially in areas that generate a lot of dust.

Dirt and improper lubrication are the most common causes of poor operation and excessive wear.

Always disconnect power tool before cleaning or servicing.

Note: The M.PGX has permanently lubricated ball bearings and does not require additional lubrication.

Routine Cleaning of Motors

Foredom Motors need air circulation through the motor housing to remove waste heat and cool the windings. Inlet and outlet slots provide the means for air flow. However, saw dust and conductive debris (like metal filings or gold dust) can enter in through these slots. If not cleaned regularly, dust can collect, making a bridge between parts, causing an electrical short.

In high dust environments, Foredom recommends cleaning the motor every 40 hours of use.

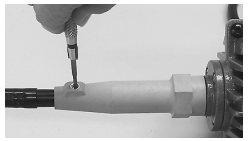
To remove dirt and dust buildup, motor brushes should be removed, cleaned and replaced, and air should be blown through the motor.

Routine Cleaning and Lubrication of Flexible Inner Shaft

The shaft should be checked, wiped clean, and re-lubricated with grease every 50 hours of use. With every 200 hours of use, the shaft should be thoroughly cleaned with solvent and lubricated. Use Foredom flex shaft grease (p/n MS10006) or high quality white lubricating grease.

Exposing the Inner Shaft

1. Remove handpiece (see page 4).

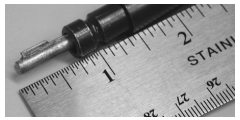


2. Loosen set screw on motor connector.

3. Slide outer sheath out of motor connector and wipe shaft clean.

4. Apply a **very light** coating of lubrication to shaft starting at the top and working downward to about one inch from the handpiece end. Apply grease with your finger tip or small brush. Don't overdo, apply a light film of grease. Once the machine is running, the shaft itself will spread the grease. If too much grease is applied, the excess will work its way into the handpiece and will make the handpiece run hot. For this reason, apply a bit less near the handpiece end of the shaft.

Never operate the motor with the outer sheath removed from the flexible shaft.



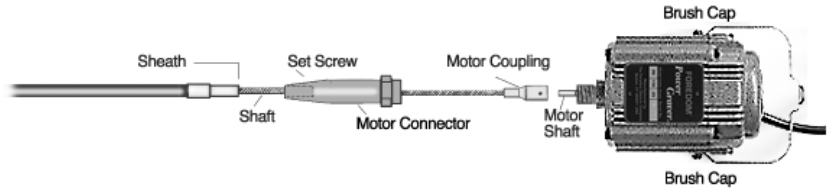
IMPORTANT!

5. Replace and adjust sheath so that shaft key tip extends 3/4″ (19mm) from sheath. Retighten the set screw in motor connector.

6. Clean outside of sheath by wiping with a cloth.

7. Hang and run the motor for about 10 minutes before attaching the handpiece to allow enough time for the grease to warm up, spread and drain off. Wipe off any excess grease at tip end of sheath.

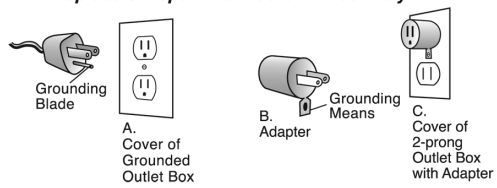
8. Re-attach handpiece.



- ***Always use dust collection, respirator, or face mask to prevent inhalation of dust particles from workpiece or abrasives.***
- ***Never*** use or continue to use a graver or accessory which appears to be damaged. Inspect each graver for cracks or flaws before using it.
- ***Always*** insert the shank or arbor of an accessory or mandrel into the collet of the handpiece as far as possible in order to provide proper support and tighten the collet securely.
- ***Never*** use excessive side pressures which may tend to bend or break the shank or arbor of an accessory. Let the impact of the hammer do the work.
- ***Do not*** stall the motor by jamming or using excessive pressure on the accessory. This can result in damage to the motor or flexible shaft.
- ***Never*** operate the motor with the outer sheath removed from the flexible shaft.
- ***Always disconnect*** the power cord before servicing the motor or removing the flexible shaft or sheath.
- ***Never*** operate your power tool during a perceptible power decrease. Turn power tool off and do not use until power is fully restored.

- ***Use proper grounding procedures.*** This tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal. If your unit is for use on less than 150 volts, it has a plug that looks like sketch A in the diagram below. An adapter (sketches B and C) can be used for connecting plugs as shown below to 2-prong receptacles. The green colored rigid ear, lug, etc., extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box. **Some jurisdictions, including Canada, prohibit the use of 3 to 2 prong adapters. Where prohibited, they should not be used.** Use only 3-wire extension cords that have 3-prong grounding type plugs and 3-pole receptacles that accept the tool's plug. Always disconnect the power cord before servicing the machine. Never use in an area where flammable vapors are present.

Replace or repair worn cord immediately.



Accessories

Collets: HP602 (1/16″), HP603 (3/32″), 604 (1/8″) and HP605 (3mm)

Gravers: A-G91 #52 Round
A-G92 #3 Onglette
A-G93 #2 Bevel
A-G94 #40 Flat
10215 Carbide Stylus
10177P Anvil Point

The PowerGraver® Kit

The Foredom® PowerGraver is a complete power tool used to perform a wide variety of tasks such as engraving, stone setting, bright cutting, bead raising, and other applications requiring the use of a graver or a hammering effect. Foredom power tools are manufactured to high standards of precision and with proper use and regular maintenance will give you years of trouble-free performance.

The Foredom PowerGraver Kit K.2293 consists of a permanent magnet DC motor, flexible shaft with neoprene sheath, dedicated handpiece with palm rest, variable speed dial control, and accessories listed at left.

The Foredom PowerGraver Kit K.2293 also includes collet changing wrenches, handpiece oil, flexible shaft grease, 32-minute instructional DVD and booklet.

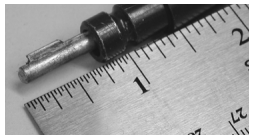
Locate and identify all components before discarding the packing list and materials that came with your PowerGraver.

An optional on/off foot switch is available.

Assembly Instructions

Always make sure your power tool is unplugged during assembly.

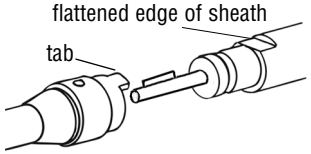
The PowerGraver ships with the shaft and sheath assembled, however, **please check to be sure that the tip of the shaft extends 3⁄4″ beyond the end of the sheath.** If it



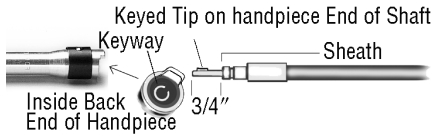
IMPORTANT!

needs to be adjusted, place the entire unit on a flat surface with shaft and sheath extended straight. Adjust the exposed tip of the flexible shaft so that it extends 3/4″ beyond the sheath, as shown. This is done by loosening the set screw in the motor connector and moving the sheath in or out of the motor connector. When the correct adjustment is made, tighten the set screw in the connector. See photo on bottom of page 6.

Connecting the Handpiece:

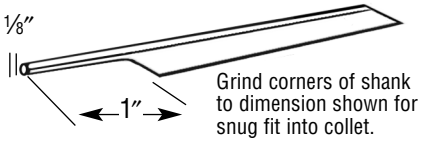


Unlike other Foredom Handpieces, the H.9D handpiece has a tab on the end where it connects to the shaft and sheath (see drawing). The tab slides over the flattened edge on the sheath. **The H.9D will not fit other Foredom sheaths.** However, other handpieces can be attached to the PowerGraver shaft for slow speed jobs.



1. **In addition to aligning the outer tab,** the keyed tip at the end of the flexible shaft must be lined up with the keyway inside the end of the handpiece. Do this by looking into the rear of the handpiece before pushing it on. If it is not in line, turn the key tip or the handpiece to the correct position while being sure to also align the outer tab with the flat outer edge of the shaft. **Both connections must be properly aligned and they move or turn independently of eachother.** The handpiece is easy to remove from the flexible shaft. To **remove,** simply pull the handpiece off the shaft and sheath with a firm grip.

2. **Install the Palm Rest.** Slide the larger opening over the front of the handpiece and place it as close to the impact adjustment ring as possible. Rotate the palm rest to the most comfortable position and tighten set screw with a small flat-head screwdriver. Use of the palm rest is a matter of personal preference. You may find that the palm rest is more appropriate for some applications than others.



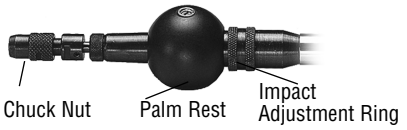
Installing Accessories

The PowerGraver can take standard gravers and other accessories with 1/16″ (1.6mm), 3/32″ (2.35mm), 1/8″ (3.18mm) and 3mm diameter shanks. Choose the correct accessory for your particular application. We recommend that you grind and trim standard graver shanks to the dimension illustrated above.

To install an accessory, insert one wrench into the wrench flats of handpiece. Insert other wrench into wrench flats of chuck nut. Loosen chuck nut. Insert accessory as far as possible into the collet. Tighten chuck nut. Test for a secure hold by pulling on accessory. Remove wrenches. To release an accessory, follow the same steps.

Changing Collets

The H.9D handpiece has collets to fit four different shank sizes: 1/16″, 3/32″, 1/8″ and 3mm. To use the correct collet size for the shank of the accessory you are using, it is sometimes necessary to change a collet. The collet holds the accessory securely in the handpiece. Unscrew the chuck nut and slip out collet. Slip in new collet and screw the chuck nut back into place.



Adjusting Impact of Hammer

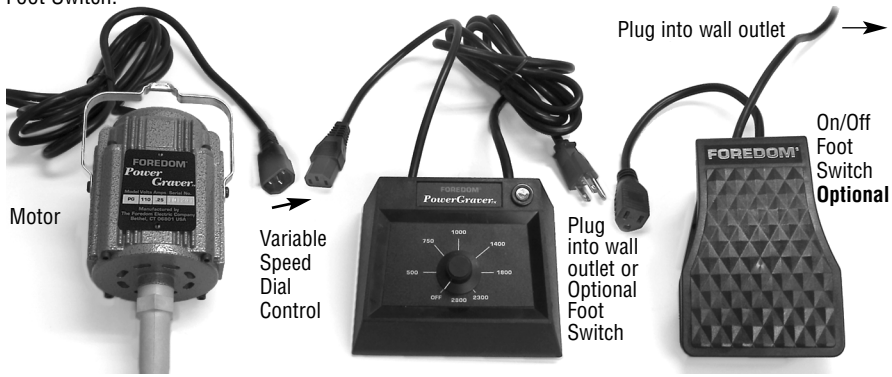
The impact of the stroke is adjusted by rotating the knurled ring on the handpiece clockwise towards the chuck nut for a lighter impact – and counterclockwise towards the back for a heavier impact.

Connecting Motor and Control

1. Connect male plug of motor to female cord of Dial Control.

2. Connect male cord of Dial Control into wall outlet or into female cord of Optional On/Off Foot Switch.

3. Plug the Optional On/Off Foot Switch into an electrical outlet.



Operation

Read all safety instructions on pages 2 and 3 before using your Foredom PowerGraver. Wear proper eye and face protection to protect yourself from injuries caused by flying debris or chips from the work being done.

Your Foredom motor may be operated in a vertical or horizontal position. If the motor is hung up above a workbench, be sure to fasten it securely.

Do Not Bend the Flexible Shaft at a Tight Angle. Shafts and sheaths last longer when they are used without sharp bends. If used at angles or loops, wear will occur at the points of greatest friction.

Do Not Force the Tool. Let the speed of the tool do the work. Avoid using too much pressure.

Stroke/Speed Adjustment

The strokes per minute are determined by motor speed, which can be varied from 500 to 2,800 strokes. Set the speed desired with the knob on the Variable Speed Dial Control. Both speed and impact can be adjusted while the motor is running. The On/Off Foot Switch will turn the motor on or off at the speed set on the speed control.